



Attorney Docket No: 0492611-0543/MIT-9277CON 1

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Seleznev, et al.

Examiner: To be assigned

Serial No.: 10/799,436

Art Unit: 1751

Filing Date: March 12, 2004

Title: VACUUM PROCESSING FOR FABRICATION OF  
SUPERCONDUCTING THIN FILMS FABRICATED BY METAL-  
ORGANIC PROCESSING

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, on February 25, 2005.

Susan M. Dinsmore

**STATEMENT FILED PURSUANT TO THE DUTY OF DISCLOSURE**

**UNDER 37 CFR §§1.56, 1.97 AND 1.98**

Pursuant to the duty of disclosure under 37 C.F.R. §§1.56, 1.97 and 1.98, Applicants respectfully request consideration of this Information Disclosure Statement.

**PART I: Compliance with 37 C.F.R. §1.97**

(Select A, B or C below)

A. ☒ This Information Disclosure Statement has been filed:

(check 1, 2 and/or 3 below)

1. ☐ within three months of the filing date of the above identified U.S. Patent application;
2. ☐ within three months of the filing date of the entry of the National Stage, as set forth in 37 C.F.R. §1.491, in an International application; and/or

3. ☒ before the mailing date of the first Office Action on the merits in the above-identified application.

No fee or certification is required.

- B. ☐ This Information Disclosure Statement has been filed more than three months after the filing date of the present application and after the mailing date of this first Office Action, but before the mailing date of either a final action under 37 C.F.R. §1.113 or a Notice of Allowance under 37 C.F.R. §1.311.

(check 1 or 2 below)

1. ☐ The fee of \$180 as set forth in 37 C.F.R. §1.17(p) is enclosed; or
2. ☐ Applicants hereby certify, as specified in 37 C.F.R. §1.97(e), that (check a or b below)
  - a. ☐ each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign Patent Office in a counterpart for this application not more than three months prior to the filing of this Statement; or
  - b. ☐ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign Patent Office in a counterpart for this application or, to the knowledge of the undersigned after making reasonable inquiry, was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this Statement.
  - c. ☐ items indicated by an asterisk were identified in a recent review of related files.

- C. ☐ This Information Disclosure Statement has been filed after the mailing date of either a Final action under 37 C.F.R. §1.113 or a Notice of Allowance under 37 C.F.R. §1.311 and before payment of an Issue Fee.

(check 1, 2, and 3 below)

1. ☐ The Applicant hereby certifies, as specified in 37 C.F.R. §1.97(e), that: (check a or b below)

- a. ☐ each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign Patent Office in a counterpart for this application not more than three months prior to the filing of this Statement.
  - b. ☐ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign Patent Office in a counterpart for this application or, to the knowledge of the undersigned after making reasonable inquiry, was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this Statement.
- 2. ☐ A Petition requesting consideration of the Information Disclosure Statement is attached.
  - 3. ☐ The Petition Fee of \$130 as set forth in 37 C.F.R. §1.17(i)(1) is enclosed.

PART II - Information Cited

- A. ☒ The Applicant hereby makes of record in the above-identified application the reference(s) listed on the attached form PTO-1449 (modified). The order of presentation of the references should not be construed as an indication of the importance of the references.
- B. ☐ The Applicant hereby makes the following additional information of record in the above-identified application:

PART III: Explanation of Non-English Language References and Remarks Concerning Other Information Cited

- A. ☐ The following is a concise explanation of the relevance of each non-English language reference listed on the attached form PTO-1449 (modified):
- B. ☐ The following are remarks concerning the other information cited:

PART IV: Remarks

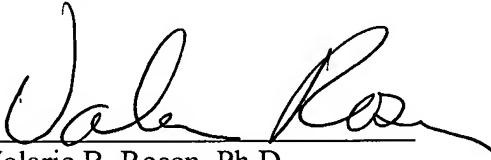
- A.     ☒     Copies of references  
          (check 1 or 2 below)
1.     ☒     A copy of each of the references cited on the attached form PTO-1449 (modified) is enclosed, except for U.S. patents and U.S. patent application publications for which the submission requirement has been waived by the PTO in the Official Gazette Notice of August 5, 2003, for applications filed after June 30, 2003.
  2.     ☒     Copies of certain of the references cited on the attached form PTO-1449 (modified) are not enclosed because each of these references (indicated by asterisk) was previously cited by or submitted to the Office in a prior application, U.S.S.N. 10/194,561, which prior application is relied upon for an earlier filing date under 35 U.S.C. § 120.
- B.     ☒     It is respectfully requested that:  
          (check 1, 2, and 3 below)
1.     ☒     The Examiner consider completely the cited information, along with any other information, in reaching a determination concerning the patentability of the present claims;
  2.     ☒     The enclosed form PTO-1449 be signed by the Examiner to evidence that the cited patent(s) and publication(s) has (have) been fully considered by the Patent and Trademark Office during the examination of this application;
  3.     ☒     The citations for the patent(s) and publication(s) be printed on any patent which issues from this application.
- C.     ☒     By submitting this Information Disclosure Statement, Applicants make no representation that a search has been performed, of the extent of any search performed, or that more material information may not exist.

- D. [X] By submitting this Information Disclosure Statement, Applicants make no representation that the information cited in the Statement is, or is considered to be, material to patentability as defined in 37 C.F.R. §1.56(b).
- E. [X] By submitting this Information Disclosure Statement, Applicants make no representation that the information cited in the Statement is, or is considered to be, in fact, prior art as defined by 35 U.S.C. §102.
- F. [X] Notwithstanding any statements by Applicants, the Examiner is urged to form his or her own conclusions regarding the relevance of the cited reference(s).

An early and favorable action is hereby requested.

Please charge any additional fees or credit any overpayments to our Deposit Account No. 03-1721.

Respectfully submitted,

By:   
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Dated: February 25, 2005

<b>Form PTO-1401</b> (REV. 8-83) <b>INFORMATION DISCLOSURE STATEMENT</b> (Use several sheets if necessary)	U.S. Department of Commerce Patent and Trademark Office		Atty. Docket: 0492611-0543/MIT- 9277CON I	In re Application No. 10/799,436
	Applicant: Seleznev, <i>et al.</i>			
	Filing Date: March 12, 2004		Group: 1751	

### U.S. PATENT DOCUMENTS

Examiner's Initials	U.S. Patent No.	Applicant	Issue Date	Class	Subclass
	4,931,425	Kimura, et al.	June, 1990		
	4,959,346	Mogro-Campero, et al.	September 25, 1990	505	1
	5,143,898	Takano, et al.	September 1, 1992	505	1
	5,225,561	Kirlin, et al.	July, 1993		
	5,231,074	Cima, et al.	July 27, 1993	505	1
	5,280,012	Kirlin, et al.	January, 1994		
	5,296,460	Wessels, et al.	March, 1994		
	5,306,698	Ahn, et al.	April 26, 1994	505	475
	5,308,800	Wehrle, et al.	May 3, 1994	505	400
	5,319,118	Norman, et al.	June, 1994		
	5,453,494	Kirlin, et al.	September, 1995		
	5,603,983	Clough, et al.	February, 1997		
	5,661,114	Otto, et al.	August 26, 1997	505	501
	5,741,377	Goyal, et al.	April 21, 1998	148	512
	5,850,098	Butler, et al.	December 15, 1998	257	467
	5,854,587	Horwitz, et al.	December 29, 1998	338	22
	5,856,277	Chen, et al.	January 5, 1999	505	452
	5,972,847	Feenstra, et al.	October 26, 1999	505	473
	6,172,009	Smith, et al.	January 9, 2001	505	473
	6,486,100	Lee, et al.	November 26, 2002	505	470
	6,673,387	Zhang, et al.	January 6, 2004	427	62

### U.S. PATENT APPLICATIONS

Examiner's Initials:	Serial Number:	Applicant:	Filing Date:	Group:	Art Unit:
	10/799,388	Seleznev, et al.	March 12, 2004		1751

Form PTO-1449 (REV. 8-83)		U.S. Department of Commerce Patent and Trademark Office		Atty. Docket: 0492611-0543/MIT- 9277CON I		In re Application No. 10/799,436	
INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)				Applicant: Seleznev, et al.			
				Filing Date: March 12, 2004		Group: 1751	
	2002/0182451	Smith, et al.	December 5, 2002				
	2003/0050195	Wiesmann, et al.	March 13, 2003				
FOREIGN PATENT DOCUMENTS							
Examiner's Initials	Document No.	Country	Date	Translation			
				Yes	No		
	WO 96/32201	PCT	October 17, 1996				
OTHER DOCUMENTS							
Examiner's Initials	Citation (Including Author, Title, Date, Pertinent Pages, Etc.)						
	Berkowitz, et al., "Increased Transition Temperature in <i>in situ</i> Coevaporated YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-δ</sub> Thin Films by Low Temperature Post-annealing", <i>Appl. Phys. Lett.</i> <b>65</b> 1587-1589 (1994)						
	Chan, et al., "Effect of the post-Deposition Processing Ambient on the Preparation of Superconducting YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-x</sub> Coevaporated Thin Films Using a BaF <sub>2</sub> Source", <i>Appl. Phys. Lett.</i> <b>53</b> 1443-1445 (1988)						
	*Cima, et al., "Conversion Kinetics of Oxyfluoride-Derived YBCO Films", <i>Materials Research Society Fall Conference</i> , November 28-December 3, 1999						
	de Obaldia, et al., "Coexistence of Grains With Differing Orthorhombicity in High Quality YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-δ</sub> Thin Films", <i>Appl. Phys. Lett.</i> <b>65</b> 3395-3397 (1994)						
	DeSantolo, et al., "Preparation of High T <sub>c</sub> and J <sub>c</sub> Films of Ba <sub>2</sub> YCu <sub>3</sub> O <sub>7</sub> Using Laser Evaporation of a Composite Target Containing BaF <sub>2</sub> ", <i>Appl. Phys. Lett.</i> <b>52</b> 1995-1997 (1988)						
	Feenstra, et al., "Effect of Oxygen Pressure on the Synthesis of YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-x</sub> Thin Films by Post-Deposition Annealing", <i>J. Appl. Phys.</i> <b>69</b> 6569-6585 (1991)						
	Foltyn, et al., "Pulsed Laser Deposition of Thick YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-δ</sub> Films With J <sub>c</sub> >1 MA/cm <sup>2</sup> ", <i>Appl. Phys. Lett.</i> <b>63</b> 1848-1850 (1993)						
	Gupta, et al., "Superconducting Oxide Films with High Transition Temperature Prepared from Metal Trifluoroacetate Precursors", <i>Appl. Phys. Lett.</i> <b>52</b> 2077-2079 (1988)						
	He, et al., "Deposition of Biaxially-Oriented Metal and Oxide Buffer-Layer Films on Textured Ni Tapes: New Substrates for High-Current, High-Temperature Superconductors", <i>Physica C</i> <b>275</b> 155-161 (1997)						
	Juang, et al., "Enhancement of Critical Current Density in Direct-Current-Sputtered TlBa <sub>2</sub> Ca <sub>2</sub> Cu <sub>3</sub> O <sub>9±δ</sub> Superconducting Thin Films", <i>Appl. Phys. Lett.</i> <b>66</b> 885-887 (1995)						
	Krause, Carolyn, "Hot Wire: ORNL's Promising Route to Superconductivity", <i>Oak Ridge National Laboratory Review</i> <b>29</b> 2-7 (1996)						
	Mankiewich, et al., "High Critical-Current Density Ba <sub>2</sub> YCu <sub>3</sub> O <sub>7</sub> Thin Films Produced by Coevaporation of Y <sub>1</sub> Cu <sub>1</sub> and BaF <sub>2</sub> ", <i>High Temperature Superconductivity</i> <b>1</b> 18a-18g (1986-1988)						
	Mankiewich, et al., "Preparation and Processing of Thin Film Ba <sub>2</sub> YCu <sub>3</sub> O <sub>7</sub> ", <i>High Temperature Superconductivity</i> <b>1</b> 17a-17q (1986-1988)						
	Mankiewich, et al., "Reproducible Technique for Fabrication of Thin Films of High Transition Temperature Superconductors", <i>High Temperature Superconductivity</i> <b>1</b> 19a-19c (1986-1988)						

<b>Form PTO-1449</b>  <b>(REV. 8-83)</b>	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket: 0492611-0543/MIT- 9277CON I	In re Application No. 10/799,436		
<b>INFORMATION DISCLOSURE STATEMENT</b> (Use several sheets if necessary)		Applicant: Seleznev, et al. Filing Date: March 12, 2004 Group: 1751			
	McIntyre, et al., "Effect of Growth Conditions on the Properties and Morphology of Chemically Derived Epitaxial Thin Films of Ba <sub>2</sub> YCu <sub>3</sub> O <sub>7-x</sub> on (001) LaAlO <sub>3</sub> ", <i>J. Appl. Phys.</i> <b>71</b> 1868-1877 (1992)				
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	Roas, et al., Epitaxial Growth of YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-x</sub> Thin Films by a Laser Evaporation Process", <i>Appl. Phys. Lett.</i> <b>53</b> 1557-1559 (1988)				
	*Seleznev, et al., "Conversion Kinetics of Oxyfluoride-Derived YBCO Films", <i>Materials Research Society Fall Conference</i> , November 27-December 1, 2000				
	Skofronick, et al., "Orientation of YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-x</sub> Films on Unbuffered and CeO <sub>2</sub> -Buffered Yttria-Stabilized Zirconia Substrates", <i>J. Appl. Phys.</i> <b>76</b> 4753-4760 (1994)				
	*Smith, et al., "High Critical Current Density Thick MOD-Derived YBCO Films", <i>IEEE Transactions on Applied Superconductivity</i> , <b>9</b> 1531-1534 (1999)				
	*Solovyov, et al., "Ex-Situ Post-Deposition Processing for Large Area Y <sub>1</sub> Ba <sub>2</sub> Cu <sub>3</sub> O <sub>7</sub> Films and Coated Tapes", <i>IEEE Transactions on Applied Superconductivity</i> <b>11</b> 2939-2942 (2001)				
	*Solovyov, et al., "Growth Rate Limiting Mechanisms of Y <sub>1</sub> Ba <sub>2</sub> Cu <sub>3</sub> O <sub>7</sub> Films Manufactured by Ex Situ Processing", <i>Physica C</i> <b>353</b> 14-22 (2001)				
	Suenaga, "Growth Kinetics and Microstructures of YBCO Fabricated by the BaF <sub>2</sub> Process", <i>U.S. Department of Energy, Superconductivity Program for Electrical Systems</i> , September 6, 2000				
	Suenaga, et al., "Practical Conductor Development for Electrical Power Systems Utilizing High T <sub>c</sub> Oxides", <i>Brookhaven National Laboratory Peer Review</i> , August 1-3, 2001				
	Suenaga, et al., "Superconductivity for Electric Systems", <i>U.S. Department of Energy Superconductivity program for Electrical Systems, 2000 Annual Peer Review, Brookhaven National Laboratory Peer Review</i> , July 17-19, 2000				
	Tanaka, et al., High-J <sub>c</sub> Superconducting Single Crystalline HoBaCuO Thin Films by Sputtering", <i>Jpn. J. Appl. Phys.</i> <b>27</b> L622-L624 (1988)				
	U.S. Department of Energy's Superconductivity Program for Electric Systems 1996 Annual Peer Review, July 31 and August 1, 1996				
	U.S. Department of Energy's 1997 Wire Development Workshop, February 6-7, 1997				
	Wu, et al., "Preparation of High Quality YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7-δ</sub> Thick Films on Flexible Ni-Based Alloy Substrates with Textured Buffer Layers", <i>IEEE Transactions on Applied Superconductivity</i> <b>5</b> 2001-2006 (1995)				
	Yee, et al., "Critical Current and Texture Relationships in YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7</sub> Thin Films", <i>American Institute of Physics, Conference Proceedings 165 Thin Film Processing and Characterization of High Temperature Superconductors</i> , Harper, et al., eds., American Institute of Physics, 132-140 (1988)				
	Young, et al., "Superconductivity in the Fluorinated YBaCuO", <i>Mat. Res. Soc. Symp. Proc.</i> <b>99</b> 549-552 (1988)				